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Original Research

Efficacy Of Superficial Radial Nerve Block For Lateral Humeral Epicondylitis: A Randomised Placebo Controlled Study

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Abstract
Elevated levels of substance-P, calcitonin gene related peptide, and glutamate has been found within the ECRB tendon in patients with chronic tennis elbow giving another etiology of the pain which is present in the absence of inflammation. A double blinded placebo controlled randomized trial was conducted where 102 Individuals diagnosed to be a case of lateral humeral epicondylitis by a senior orthopaedic surgeon in the orthopaedics department of JSS hospital and those who give due consent were enrolled into the study and randomly divided into 2 groups of 51 each with one group receiving 3ml of preservative free 2% lignocaine and the other receiving 3ml of normal saline as placebo. On comparing the Mean Final score between both the groups at the time of presentation ,1 week, 2 week and 6 weeks it was observed that the reduction of Mean Final score was found to be statistically significant between both the groups at presentation, 1 week ,2 weeks and 6 weeks of duration. On comparing the Mean Final score at various intervals, it was found that Mean Final score was much lesser in the study group when compared to control group.

Keywords: Efficacy, Superficial Radial Nerve Block, Lateral Humeral Epicondylitis

Introduction

There is no defined pathogenesis or cause known for the pain and disability caused due to LE. It is mostly multifactorial with an emphasis to repeated microtrauma and general overuse in genetically predisposed individuals.[1]

Electromyography analysis done by Morris and associates had found that in healthy high level tennis players the highest level of activity was found in ECRB, ECRL and EDC. Amongst these, ECRB was found to have the highest activity.

Lanz and wachsmuth have described 7 bursae, including the radio humeral bursa which is located deep to the common extensor tendon and superficial to the radio humeral joint capsule. Some have postulated that these bursae could be a potential cause of LE as repetitive wrist extension with arm in pronation inflamed these structures.[2]

Evaluation of vascularity of the lateral epicondylar region was done to help understand the etiology of tennis elbow. Schneeberger and masquelet studied the arterial anatomy of ECRB in cadavers and found an avascular zone on the undersurface of the extensor tendon origin in most of the cadavers. [3]

There were also several others who noted hypo vascular zones at the lateral epicondyle and 2-3 distal to where the extensors insert. There have been few hypotheses which say that another possible mechanism could be the involvement of the autonomic nervous system, which controls the vasoconstriction and vasodilation of the vascular channels surrounding the ECRB.[4]

Smith et al discovered abnormal sympathetic vasomotor response in about 40 patients with LE compared with

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the contralateral unaffected side using a laser doppler flowmeter.

Laban et al stated the importance of examining the shoulder, any shoulder pathology may place excessive stress over the common extensor origin further could lead to LE.

Bunata et al studied the anatomical relationship between the ECRB and the lateral edge of the capitellum in 85 cadaveric elbows where he found that the undersurface is vulnerable to friction as the ECRL compresses the ECRB against the lateral edge of the capitellum. [5]

Dellon et al described a neuroma of the posterior cutaneous nerve of the forearm as a potential source of the pain, especially after the surgical treatment of LE. This is especially important in patients with recalcitrant pain following surgical treatment. He further reported that in a series of patients in whom neuroma was excised and proximal end of nerve was implanted into brachioradialis has excellent pain relief. It was also observed that patients who underwent denervation of the lateral epicondyle have a rapid and effective improvement in pain relief and faster return to work than in patients who received an epicondylectomy. [6]

Elevated levels of substance-P, calcitonin gene related peptide, and glutamate has been found within the ECRB tendon in patients with chronic tennis elbow giving another etiology of the pain which is present in the absence of inflammation.

Nirschl and Ashman proposed a classification system based on the pain experienced. Though there is no correlation between the histopathological lesions and clinical phases described below theoretical correlation is helpful for the treatment.

Methodology:

Study Design: Randomised control study

Sampling technique: Computerized random sampling

Based on the study done by Ang Li Et al by evaluating the meta-analysis for the treatment of Lateral humeral Epicondylitis the odds ratio was found to be 3.33, using the above mentioned odd Ratio at 95 % Confidence Interval, 80 % Power using the Kelsey Formula for RCT study the sample size was 51 in each group.(82)

Sample size of test group-51
Sample size of placebo group-51
Total sample size-102

Sample size was calculated using the formula –

$n = (Z\alpha + Z\beta)^2 \times \sigma^2 / d^2$

Where,

$Z\alpha$ = likelihood of incorrectly rejecting a valid null hypothesis

$Z\beta$ = likelihood of failing to rule out an incorrect null hypothesis

σ = standard deviation of the population being studied

d = size of the effect that is clinically worthwhile to detect

Study Population and source of data:

All individuals above 18 years who fulfilled the inclusion criteria and gave consent for the study were enrolled. 102 individuals were enrolled in this study.

Study setting and Method of collection of data:

A double blinded placebo controlled randomized trial was conducted where 102 Individuals diagnosed to be a case of lateral humeral epicondylitis by a senior orthopaedic surgeon in the orthopaedics department of JSS hospital and those who give due consent were enrolled into the study and randomly divided into 2 groups of 51 each with one group receiving 3ml of preservative free 2% lignocaine and the other receiving 3ml of normal saline as placebo.The first webspace is defined by 2 lines one drawn along the medial border of the first metacarpal and another drawn along the lateral border of 2nd metacarpal. Apex of the triangle is formed by a point joining both the lines. A perpendicular is drawn from the apex and the center of that line forms the center of the first webspace.

Following which patients based on the severity of their disease and pain relief they experience are taught activity modification techniques

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Figure 1: Identification of first webspace and point of injection(Borders of the first webspace)

Subject eligibility:

a. Inclusion Criteria:

- Patients between the ages of 18-60
- Individuals diagnosed to be a case of lateral humeral epicondylitis with positive Cozen's/Mill's test

b. Exclusion Criteria:

- Patients previously treated for lateral humeral epicondylitis with local steroid infiltration/platelet rich plasma injections.
- Patients with h/o previous trauma to the elbow
- Patients allergic to lignocaine.
- Any other pathological causes for lateral humeral epicondylitis
- Any skin lesions around the injection site Congenital anomalies of upper limb or neurological disorders

Study assessment of end point.

To compare VAS Score and PRTEE post injection between the test and placebo group after 5mins, 1 week, 2 weeks and 6 weeks.

Results:

Table 1: Comparison of VAS Score among study subjects in both the groups at Presentation, 5 min, 1 week, 2 week and 6 weeks

	Group						P Value (Mann Whitney U test)
	Study			Control			
	Mean	Standard Deviation	Median	Mean	Standard Deviation	Median	
VAS Presentation	5	2	5	5	2	5	0.678
VAS @ 5 Min	3	2	2	4	2	4	0.001
VAS @1 week	2	2	2	4	3	4	0.001
VAS @2 week	2	2	1	4	2	4	0.0001
VAS @6 week	2	2	1	4	2	4	0.0001

On comparing the VAS Score between both the groups at the time of presentation, 5 minutes, 1 week, 2 week and 6 weeks it was observed that the reduction of VAS score was found to be statistically significant between both the groups at 5 min, 1 week ,2 weeks and 6 weeks of duration. On comparing the mean VAS score at different intervals, it was found that Mean VAS score was much lesser in the study group when compared to control group.

Table 2 : Comparison of Pain Score among study subjects in both the groups at Presentation, 1 week, 2 week and 6 weeks

	T/P						Independent T test (P value)
	Study			Control			
	Mean	Standard Deviation	Median	Mean	Standard Deviation	Median	
Pain score @presentation	24	6	23	25	7	24	0.582

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Pain Score @ 1 week	13	10	12	22	8	21	0.0001
Pain Score @ 2 week	12	10	8	21	10	19	0.0001
Pain Score @ 6 weeks	12	10	8	21	10	20	0..0001

On comparing the Mean Pain Score between both the groups at the time of presentation ,1 week, 2 week and 6 weeks it was observed that the reduction of pain score was found to be statistically significant between both the groups at 1 week ,2 weeks and 6 weeks of duration. On comparing the mean Pain score at various intervals, it was found that Mean Pain score was much lesser in the study group when compared to control group.

Table 3: Comparison of Functional Subscale Score among study subjects in both the groups at Presentation, 1 week, 2 week and 6 weeks

	T/P						Independent T test (P value)
	Case			Control			
	Mean	Standard Deviation	Median	Mean	Standard Deviation	Median	
Functional subscale @presentation	28	6	27	28	6	30	0.760
Functional subscale @ 1 week	15	12	12	27	8	27	0.0001
Functional subscale @ 2 week	14	11	10	23	10	22	0.0001
Functional subscale @ 6 week	13	10	9	23	10	22	0.0001

On comparing the Mean Functional subscale score between both the groups at the time of presentation ,1 week, 2 week and 6 weeks it was observed that the reduction of Mean Functional subscale score was found to be statistically significant between both the groups at 1 week ,2 weeks and 6 weeks of duration. On comparing the Mean Functional subscale score at various intervals, it was found that Mean Functional subscale score was much lesser in the study group when compared to control group.

Table 4: Comparison of Final Score among study subjects in both the groups at Presentation, 1 week, 2 week and 6 weeks

	T/P						Independent T test (P value)
	Case			Control			
	Mean	Standard Deviation	Median	Mean	Standard Deviation	Median	
Final score @ Presentation	81	42	65	107	48	95	0.04
Final score @ 1 week	29	21	21	48	17	49	0.001
Final score @ 2 week	26	21	19	45	20	44	0.001
Final score @ 6 week	26	21	17	44	21	43	0.001

On comparing the Mean Final score between both the groups at the time of presentation ,1 week, 2 week and 6 weeks it was observed that the reduction of Mean Final score was found to be statistically significant between both the groups at presentation, 1 week ,2 weeks and 6 weeks of duration. On comparing the Mean Final score at various intervals, it was found that Mean Final score was much lesser in the study group when compared to control group.

Discussion

LE is a condition as discussed before whose pathogenesis is not clearly defined and is a self-limiting disease when the stimuli causing the pain and disability is limited.

Any treatment adopted whichever the modality cannot change the natural course of the disease, any treatment given is but palliative

In our study we observed that patients belonging to both the groups have had statistically significant pain relief.

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A common factor between both the groups is activity modification we have employed depending on the severity of the disease presentation. [7]

Arirachakaran et al in their study of PRP vs autologous blood injections vs steroids found similar results as our study where improvement in PRTEE was seen.

The decrease in the perception of pain has further helped patients be compliant with activity modifications. Helping them to go through the natural course of the disease with reduced pain.[8]

Pain relief through placebo can be attributed to placebo response and test drug to inhibition of local pain pathways inhibiting selective sensory receptors through blocking of the Na channels.

Landasa et al in their study found that activity modification and muscle strengthening were most effective for treating LE than ultrasound, shortwave diathermy. In our study activity modification might have played a significant role in improving functionality of the patient and pain reduction seemed to have acted as an adjunct for the improvement of disability of the patient.[9]

In our study we were able to define the borders of the first webspace where majority of the patients the center of the first webspace (47%) was at 3.0cm from the apex of the triangle.[10]

Other popular modalities of treatment for LE include PRP injections, steroid injections and dry needling which are expensive procedures to the patient, and they include drawing blood for PRP, multiple injections and anatomical accuracy and sterile setup for dry needling. Also, inadvertent entry into surrounding vessels maybe another risk.

Our proposed treatment modality is cheap, effective, easily reproducible with minimal side effects which resolved spontaneously. Thus, providing immediate effective pain relief.

Conclusion

Preservative free 2% Lignocaine given to block the superficial radial nerve is effective in providing pain relief immediately post injection and at 6 weeks compared to placebo in treating LE.

Early improvement in functional activities was seen to be more profound in the study group.

Activity modification might have played a pivotal role in the treatment of LE further reducing the disability of the patient and increasing patient's confidence.

References

1. Runge F. Zur genese und behandlung des schreibekramfes. Berl Klin Wochenschr. 1873;10:245.
2. Allander E. Prevalence, incidence, and remission rates of some common rheumatic diseases or syndromes. Scand J Rheumatol. 1974;3:145–53.
3. Verhaar JA. Tennis elbow: anatomical, epidemiological and therapeutic aspects. Int Orthop. 1994;18:263–7.
4. Dimberg L. The prevalence and causation of tennis elbow (lateral humeral epicondylitis) in a population of workers in an engineering industry. Ergonomics. 1987;30(3):573–9.
5. Haahr JP, Andersen JH. Physical and psychosocial risk factors for lateral epicondylitis: a population based case-referent study. Occup Environ Med. 2003;60:322–9. doi:10.1136/ oem.60.5.322.
6. Shiri R, Viikari-Juntura E, Varonen H, Heliovaara M. Prevalent and determinants of lateral and medial epicondylitis: a population study. Am J Epidemiol. 2006;164(11):1065–74.
7. Walker-Bone K, Palmer KT, Reading I, Coggon D, Cooper C. Occupation and epicondylitis: a population-based study. Rheumatology. 2012;51:305–10.
8. Doran A, Gresham GA, Rushton N, Watson C. Tennis elbow: a clinicopathologic study of 22 cases followed for 2 years. Acta orthopaedica Scandinavica. 1990 Jan 1;61(6):535-8.
9. Rath A, Perez M, Mainguené C, Masquelet A, Chevrel J. Anatomic basis of the physiopathology of the epicondylalgias: a study of the deep branch of the radial nerve. Surg Radiol Anat. 1993 Mar 1;15(1):15–9.
10. Dib-Hajj SD, Black JA, Waxman SG. Voltage-Gated Sodium Channels: Therapeutic Targets for Pain. Pain Med. 2009 Oct 1;10(7):1260–9.